



Determining Self-Efficacy and Its Related Factors in Adolescents with Major β -Thalassemia Referring to Selected Hospital in Tehran

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Abstract

Introduction: Major β -Thalassemia is one of the most common hereditary anemias in the world and is a health problem associated with the absence or reduction of globin chain production. Self-efficacy helps adolescents with chronic illness to strength their ability to handle the routine tasks and to achieve treatment goals. Because of the importance Major β -Thalassemia in adolescents and its effects on their quality of life, we decided to do this study with the aim of "Determining self-efficacy and its related factors in adolescents Major β -Thalassemia referring to selected hospital in Tehran".

Methods: The present study used a descriptive comparative cross-sectional design on 100 adolescents with Major β -Thalassemia referring to Shohadaye Tajrish hospital in Tehran in 2022. We used a census design to collect data in a fixed duration and in three work shifts in the morning, evening and night in the relevant units. The data collection tools included of demographic and Self-Efficacy Questionnaire for Children (SEQ-C). The collected data were analysed by SPSS Software version 20 via statistical tests included of Pearson or Spearman coefficient, t test and ANOVA test.

Results: The average age of the participant adolescents were 15.40 ± 2.22 . The results of the study showed that the mean score of academic, social and emotional self-efficacy were 26.17 ± 3.91 , 24.83 ± 5.33 and 24.49 ± 4.75 respectively. The score of self-efficacy of the participants were approximately in the average range in the three dimensions of the SEQ-C. However, the score of academic self-efficacy was slightly higher than the average range. There are not any significant relationships between the demographic variables and any dimensions of self-efficacy (P -value >0.05). However, the results of T-Test showed significant relationships between the social self-efficacy score and positive history of splenectomy (P -value=0.018).

Conclusions: Based on the results of the study, the self-efficacy score of participants in this study were approximately in the average range, therefore, these results showed that, health staffs such as nurses should promote the self-efficacy of adolescents with Major β -Thalassemia through health education.

INTRODUCTION

Major β -Thalassemia (MBT) is one of the most common hereditary anemias in the world. It is a health problem associated with the absence or reduction of globin chain production. MBT causes reduced production of normal hemoglobin A, ineffective hematopoiesis, anemia, and hemolysis [1]. MBT characterized by abnormal hemoglobin production, resulting in insufficient oxygenation and destruction of Red Blood Cells [2]. This hereditary disorder has regional spread pattern and it is prevalent in the Mediterranean (Italy, Spain, Portugal, Greece, parts of Russia, Cyprus), Middle East (Saudi Arabia, Iran, Turkey, and Syria), the Indian subcontinent (India and Pakistan), sub-Saharan and West Africa and Southeast Asia (Bangladesh, Indonesia, Thailand, Malaysia, and southern China) and South America. These regions called as "The Thalassemia Belt" which means that it is a region with a high incidence of Thalassemia [3].

According to the most recent census in 2018, Iran's population is 81 million approximately. Iran is a Middle Eastern country with a landmass of 1,648,195 km². At 4% of the population, Iran has a lower prevalence of β -Thalassemia gene carriers than other countries like Cyprus [4]. Overall annual prevalence of symptomatic patients is estimated at 1 in 100,000 worldwide [5]. Epidemiological studies in Iran show that MBT is the most common maverick disease in Iran as an eastern Mediterranean country [3, 6]. Approximately 3 million Iranians are carriers of this gene [7] and 26,000 Iranian patients have severe MBT [8].

The adolescents with MBT in all areas of their life deal with challenges due to the chronic nature of the disease and potential health risks that contribute to the development of depression. Major causes of mental illness are related to family (overprotective, neglectful, or hostile parents), social environment (reckless peers), and disease burden (complications, blood transfusions, iron chelation) [9-11]. These challenges are social, personal, and professional changes. Adolescence period which is synchronic with sexual puberty and activation of sexual glands is accompanied with a series of symptoms and physical and mental changes [12]. They are anxious about the duration of illness, stigma, and the fear of imminent death. At this age, patients with MBT become more aware of the disease and its effects on their performance and social relationships. Uncomfortable symptoms such as delayed sexual development or altered body image make them feel different from their peers [13-15]. Psychological detachment and growth during adolescence are essential for normal maturation to become independent. Therefore, the patient adolescent strives for daily life, and the daily debilitating illness requires parents to pay more attention and plan than before [16].

Patients and their families do nearly most treatment regimens. They should do daily medication such as

vitamins, hormones, and oral iron chelation therapy. They should do imaging studies, routine blood transfusions and scheduled visiting programs [17]. These multiple duties make the patients and their families tired and reduce their sense of self-support, social skills, independency and self-efficacy [18]. Self-efficacy as a quality-of-life factor highlights adolescents' perceptions of competent presentation ability [19]. Research shows that highly effective MBT patients are more actively involved in their health programs and have healthier lifestyles, higher self-esteem, and better relationships. Patients with the highest sense of self-efficacy are more likely to initiate or maintain specific skills even in the face of obstacles [20]. Patient self-efficacy reduces physical problems and promotes self-management and Quality of Life [21, 22].

Self-efficacy can influence on coping behaviors by improving expectations of personal efficacy. Perceived efficacy can influence on behaviors via several ways. When people have a low sense of efficacy, have no effort to gain positive outcome and they become apathetic in a dreary life. In this condition, people perceive themselves as ineffectual and therefore they cannot try to improve their conditions [23]. Self-efficacy helps patients with chronic illness such as MBT to strength their ability to handle the routine tasks and to achieve treatment goals. In this way, high level self-efficacy improves their quality of life and allow them to live in a more peaceful way alongside their illness [20]. Therefore, self-efficacy can be related to acceptance of illness with mediation effect of coping [24]. Several studies have assessed self-efficacy scores in patients with MBT. For example, in one study, parents' children with MBT were found to have a mean (34.8 ± 5.4) or weak self-efficacy score (31.4 ± 9.1) [22]. A recent study confirmed that self-efficacy in patients with thalassemia is moderate (49%) [25]. Another one descriptive study found self-efficacy in children with MBT to be moderate (52.5%) to good (45 %) [19]. Last previous studies on this subject were done in 7 years ago in Bandar Abbas [26] or with qualitative methodology [27]. Hence, different studies have various results about self-efficacy in adolescents with MBT, therefore and about the importance of MBT in adolescents and its effects on their Quality of Life, we decided to do this study with the aim of "Determining self-efficacy and its related factors in adolescents Major β -Thalassemia referring to selected hospital in Tehran."

METHODS

The present study used a descriptive comparative cross-sectional design. Descriptive research is conducted in a natural setting to answer a research question related to the incidence, prevalence, or frequency, occurrence of a phenomenon and its characteristics. Descriptive designs regardless of its type, has a determined criteria that there

is no researcher intervention and no attempt to demonstrate causality [28].

The present study was done with 100 adolescent-age children (12-18 years) with major thalassemia in Shohadaye Tajrish hospital depended to Shahid Beheshti University of Medical Sciences and their pediatric wards in Tehran. Inclusion criteria were age of 12 to 18, diagnosis of Major Beta-Thalassemia without any other chronic disease approved by physician, agreement with entering the study, consciousness and ability to write and answer the questionnaire and without any mental-psychological disorders.

The present study used a census design because of rare nature of MBT. In this method, data is collected directly from subjects of enquiry to study about incidence of some phenomena or the relationships of variables in a fixed population. This methods of data collection is cost effective and easy for researchers especially in the case of low number of samples [29]. In the present study, the researcher went to Shohadaye Tajrish hospital and showed the permission letter to the officials of the hospital. After giving permission, the researcher began census sampling in a fixed time from 1 March to 20 May 2022. Sampling lasted 10 weeks and in different shift work (morning, evening and night when the patients were awake). Ultimately, during 10 weeks, the researcher found 100 adolescents with inclusion criteria. These samples answered the questionnaires and returned to the researcher.

Demographic Questionnaire

Demographic information questioner Included adolescent's characteristics (age, gender, number of sibling, birth rank), parent characteristics (age, gender, job, insurance, economic status) and adolescents' clinical data (age at the onset of diagnosis, duration of the disease, onset of treatment, frequency of blood transfusion, history of splenectomy, family history of the disease and parental degree of consanguinity).

Self-Efficacy Questionnaire for Children (SEQ-C)

Muris (2001) has developed the SEQ-C, in a sample of 330 young adolescents included of 190 girls and 120 boys who were recruited from a regular secondary school with the age of 14 to 17 years. The SEQ-C was a scale with 24 items with three domains included of social self-efficacy related to their perceived capability for peer relationship and assertiveness, academic self-efficacy related to perceived capability to manage own learning behaviour, mastering academic subjects and fulfilling academic expectations and emotional self-efficacy related to perceived capability of coping with negative emotions. The total Cronbach's alpha was 0.88 for the self-efficacy scale. Finally the author concluded that the SEQ-C provides information on the extent to which treatment was actually successful in achieving the goals. A total self-efficacy score can be obtained by summing across all items. The scoring scale of the items were 5-point scale with one (not at all) to five (very well) [30].

The SEQ-C has three dimensions including academic, social and emotional self-efficacy with 8 items for each of them. Therefore, each dimension has 8 to 40 scores because of 5-part Likert answering pattern. The final score of the questionnaire can be 24 to 120. The validity and reliability of the Persian version of the SEQ-C has been approved in Iran. Chronbach's alpha was 0.73 for overall self-efficacy and acceptable [31]. To examine the face validity of the questionnaire, it is given to the 10 adolescents with Beta thalassemia and they were requested to determine any grammatical errors. To assess content validity of the scale, it is given to 10 nursing faculty members and they were asked to evaluate Content Validity Ratio (CVR). The CVR of the scale was acceptable (79%) for all the questions. We checked reliability of the scale by Cronbach Alpha with 20 samples of adolescents. Total Cronbach's alpha was 0.83 for overall self-efficacy and acceptable.

Data analysis Method

The data analysis was performed using SPSS-20 statistical software. Descriptive statistics used for descriptive variables using frequency, mean score and standard deviation. We assessed the normal distribution of the variables by Kolmogorov-Smirnov. Because of non-normal distribution of the self-efficacy score, we checked Skewness and Kurtosis to determine outlier data and their effects on normal distribution. Testing the Skewness and kurtosis of data are more suitable analysis for assessing normality of data comparing with other tests [32, 33]. The score of Skewness was -0.2 ± 0.2 and the score of Kurtosis was -0.2 ± 0.4 . The scores of Skewness and Kurtosis showed normal distribution in the score of self-efficacy. We checked correlation between the self-efficacy score and quantitative and qualitative variables with Pearson and Spearman's tests respectively. The researcher used correlation test and Pearson or Spearman coefficient, t test and ANOVA to compare the mean scores of overall self-efficacy and sub-scales with demographic statistics. The SEQ-C has three variable including academic, social and emotional self-efficacy with eight items for each of variables. Therefore, each variable has 8 to 40 scores because of 5-part Likert answering pattern.

RESULTS

Statistical analysis showed that the average age of the adolescents who participated in the study were 15.40 ± 2.22 and the average age of their parents who answered the questionnaires were 40.75 ± 3.80 and they have 1.56 ± 0.74 children (Table 2).

Variables of SEQ-C

The results of the study showed that the mean score of academic, social and emotional self-efficacy were 26.17 ± 3.91 , 24.83 ± 5.33 and 24.49 ± 4.75 respectively. The mean score of total self-efficacy based on the results of the statistical tests was 75.49 ± 9.74 . Considering the average score of each dimension (score of 24), the score

of participants in this study were approximately in the average range in the three variables of the SEQ-C. However, the score of academic was slightly higher than average range. Also, considering the middle score of

total self-efficacy (score of 72), the total score of self-efficacy in this study was slightly higher than average range (Table 3).

Table 1. Quantitative Demographic Variables (n=100)

Variable	N	%	Mean score ± Standard Deviation
Age of adolescent	100	100	15.40 ± 2.22
Age of parent	100	100	40.75 ± 3.80
Number of sibling	100	100	1.56 ± 0.74
Age at onset of diagnosis	100	100%	1.82 ± 1.01
Duration of illness	100	100%	15.40 ± 2.22
Age at onset of treatment	100	100%	1.82 ± 1.01
Frequency of blood transfusion in month	100	100%	2.74 ± 0.97

Table 2. Nominal Demographic Variables (n=100)

Variable	Frequency	Percent
Gender of adolescent		
Girl:	46	46%
Boy	54	54%
Birth rank		
First child: 61	61	61%
Second child: 33	33	33%
Third child: 5	5	5%
Forth child and other: 1	1	1%
Splenectomy		
Yes	50	50%
No	50	50%
Positive family history		
Yes	89	89%
No	11	11%
Parental consanguinity		
Yes	71	71%
No	29	29%
Parent's gender		
Male	13	13%
Female	87	87%
Parent's level of education		
Diploma	4	4%
Advanced diploma	20	20%
Bachelor of science	67	67%
Master of Science	7	7%
PhD	2	2%
Parent's job		
Business	56	56%
Employed	29	29%
Unemployed	15	15%
Insurance		
Yes	72	72%
No	28	28%
Economic status of family		
Low	15	15%
Middle	60	60%
High	25	25%

Table 3. The Mean Scores of Academic, Social and Emotional Self-Efficacy

Variables	Min Score	Max Score	Mean Score ± Standard Deviation
Academic self-efficacy score	16.00	63.00	26.17±3.91
Social self-efficacy score	14.00	35.00	24.83±5.33
Emotional self-efficacy score	11.00	34.00	24.49±4.75
Total self-efficacy score	52.00	90.00	75.49±9.74

Correlation between self-efficacy scores and demographic variables

Pearson or Spearman tests showed that there is not any significant relationships between the demographic variables of the adolescents and any dimensions of self-

efficacy (Table 4). However, the results of T-test showed significant relationships between social self-efficacy score and the splenectomy (P-value=0.018). In other word, the adolescents with positive history of splenectomy had significantly higher social self-efficacy

score comparing who did not have history of splenectomy.

DISCUSSION

The findings of the study showed that the mean total self-efficacy score in adolescents with thalassemia major is in the average range and similar to other studies [19,

34-36]. The average level of self-efficacy in the present study is medium and similar to Hekmatipour and colleagues' study, which was also conducted on the population of children with thalassemia in Tehran. It should be noted that the above studies were conducted on the population of teenagers living in the smaller cities comparing to Tehran.

Table 4. Correlation between the Demographic Variables of Adolescent and Self-Efficacy by Pearson or Spearman Test (n=100)

Variable	Total Self-Efficacy	Academic Self-Efficacy	Social Self-Efficacy	Emotional Self-Efficacy
Age of adolescent				
Correlation coefficient	-0.016	0.020	-0.063	0.021
Sig. (2-tailed)	0.873	0.843	0.532	0.832
Parents' age				
Correlation coefficient	-0.030	0.095	-0.103	0.100
Sig. (2-tailed)	0.765	0.349	0.310	0.325
Onset of diagnosis				
Correlation coefficient	0.101	0.132	-0.069	0.175
Sig. (2-tailed)	0.320	0.191	0.496	0.082
Number of siblings				
Correlation coefficient	0.110	0.113	0.101	0.019
Sig. (2-tailed)	0.278	0.263	0.319	0.853
Duration of illness				
Correlation coefficient	-0.016	0.020	-0.063	0.021
Sig. (2-tailed)	0.873	0.843	0.532	0.832
Age at onset of treatment				
Correlation coefficient	0.101	0.132	-0.069	0.175
Sig. (2-tailed)	0.320	0.191	0.496	0.082
Frequency of blood transfusion in month				
Correlation coefficient	0.071	0.046	-0.005	0.113
Sig. (2-tailed)	0.481	0.647	0.963	0.262
Birth rank				
Correlation coefficient	0.060	0.052	0.075	0.062
Sig. (2-tailed)	0.556	0.604	0.457	0.538
Parents' level of education				
Correlation coefficient	0.123	0.089	0.137	-0.004
Sig. (2-tailed)	0.224	0.376	0.173	0.972
Economic status of family				
Correlation coefficient	-0.020	-0.028	0.049	-0.057
Sig. (2-tailed)	0.841	0.780	0.631	0.571

Chronic diseases affect people's self-efficacy in different ways. This issue in the case of children and adolescents with chronic diseases, significantly if the disease disrupts their regular life routine due to self-treatment, causes a feeling of incompetence and inefficiency [18, 34].

Based on the results of the study, the mean of emotional self-efficacy in adolescents studied is reported to be medium, similar to previous studies [18, 34]. However, this amount is lower than that obtained for teenagers with diabetes, asthma, or healthy teenagers. Several factors affect emotional self-efficacy. Emotional self-efficacy defines the skill of managing one's inner emotions. Adolescents with higher emotional self-efficacy cope with their emotions during challenging times by consoling and comforting themselves, congratulating themselves, and solving problematic situations. Emotional self-efficacy is also the expression of feelings in a socially acceptable way, which shows a person's maturity in managing and controlling feelings and emotions. Many factors can affect emotional self-efficacy. The family and the social network that includes

the teenager have a high impact [37, 38]. Patients with thalassemia in Iran receive a good support system through the association related to patients with thalassemia, which can be effective on a relatively good score of emotional self-efficacy.

The findings of the study showed that, the mean score of social self-efficacy in the adolescents reported to be medium, similar to previous studies [18, 34]. Another type of social skill is social self-efficacy, which refers to a judgment of personal capabilities in social interactions and concepts. People with high social self-efficacy believe they can control social interactions' outcomes [39]. Those with little faith in this structure, in other words, belief in their lack of ability in advanced social interactions, do not consider their actual level of social competence or awareness of proper social behavior. Therefore, social self-efficacy is a fundamental belief or a person's ability to control social situations that lead to an optimistic attitude and positive behavior, which contribute to effectiveness in social situations [40].

Regarding the results of the study, the mean score of academic self-efficacy of the participants were slightly higher than the average range. However, in other study conducted by Mickley et al. the authors showed that chronic disease in school age children would result in effects beyond physical condition. Children with chronic diseases have less interaction with their peers, which indicates their low academic self-efficacy, which is consistent with the results of the present study [41]. Brimnejad et al. concluded that adolescents with thalassemia major and active members of the family need training in all the investigated areas, especially the nature of the disease, treatment, and complications of the disease, which indicates their low awareness and low level of self-efficacy [18]. In a study, Mohammadi et al. showed that teenagers with thalassemia feel hopeless, lonely, and have low self-esteem; thalassemia disease harms the psychosocial aspects of teenagers' lives, and these patients are weak in self-care and self-efficacy [42]. Four influential factors in academic self-efficacy include confidence in one's ability to complete homework in class, confidence in one's ability to complete homework outside of class, confidence in one's ability to interact with others in the educational system, and confidence in one's ability in Successful management of work, family and education system [41]. The results of the study showed a significant correlation between the total scores and self-efficacy subscales with demographic variables. Regarding comparing the average score of self-efficacy and its subscales in different subgroups classified according to demographic characteristics, the only significant difference was found between the average score of social self-efficacy in the two adolescents who underwent splenectomy and the group that did not undergo splenectomy. These results contradict most previous studies that have shown the relationship of different demographic variables with self-efficacy and its subscales [43, 44]. The homogeneity of the samples can be one of the causes of this contradiction.

Limitations

The limitation of this study is that patients may not have answered the questions of the questionnaire with sufficient accuracy due to fatigue and family problems. Other limitation was due to self-reported data collection; it is possible that the patients did not state their actual performance.

CONCLUSION

Based on the results of the study and comparing them other studies, we conclude that the self-efficacy level in adolescents suffering from thalassemia major and chronic diseases is low or at the average level. They feel depression, limitations in education, employment, and marriage, paying exorbitant costs for treatment with a drop in self-confidence and self-esteem and despair in life. Patients with thalassemia are mainly among the

young population and the age group of children and teenagers. Thalassemia cause adolescents to experience life with fatigue and suffering during their childhood and adolescence, and they cannot experience their living environment like healthy people. The concept of self-efficacy is at the center of Albert Bandura's social-cognitive theory, which refers to a person's ability to perform tasks and responsibilities by judging him /her. Self-efficacy refers to a person's internal state as "competence" to do what he asked them to do. In addition, learning new behaviors and implementing them in real-life situations, which strongly depends on self-efficacy, measuring self-efficacy can predict a person's intention to change behavior and intervene to increase self-efficacy. Low self-efficacy can destroy motivation, reduce aspirations, interfere with cognitive abilities, and harm physical health.

ETHICAL CONSIDERATION

This article is derived from a dissertation of Master of Science degree in Pediatric Nursing. The ethics committee of Shahid Beheshti University of Medical Sciences approved the main study with ethical code of IR.SBMU.PHARMACY.REC.1400.305. The researchers received informed consent letter from the participants and considered the ethical code in collecting data for anonymise of the participants and the right of exit the study whenever they want. The participants of the study were not deprived of any medical and nursing care in case of not participation in the study.

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AUTHOR CONTRIBUTION

Marwah Khalaf Saad: researcher, data gatherer. Fereshteh Javaheri Tehrani: supervisor, data analyser. Shabnam Shariatpanahi: supervisor, result reviser. Zahra Abedini: supervisor, writer manuscript. Maliheh Nasiri: statistics consultant

CONFLICT OF INTEREST

There is no conflict of interest between the authors.

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REFERENCES

1. Biswas S, Nag A, Ghosh K, Ray R, Roy K, Bandyopadhyay A, et al. Genetic determinants related to pharmacological induction of foetal haemoglobin in transfusion-dependent HbE-beta thalassaemia. *Ann Hematol.* 2019;98(2):289-99. doi: 10.1007/s00277-018-3536-x pmid: 30413899
2. Grace R, Ware RE. *Pediatric Hematology, An Issue of Hematology/Oncology Clinics of North America*, Ebook: Elsevier Health Sciences 2019.

3. Mevada ST, Al Saadon M, Zachariah M, Al Rawas AH, Wali Y. Impact of Burden of Thalassemia Major on Health-related Quality of Life in Omani Children. *J Pediatr Hematol Oncol*. 2016;38(5):384-8. doi: 10.1097/MPH.0000000000000565 pmid: 27164523
4. Hadipour Dehshal M, Tabrizi Namini M, Hantoushzadeh R, Yousefi Darestani S. beta-Thalassemia in Iran: Things Everyone Needs to Know About This Disease. *Hemoglobin*. 2019;43(3):166-73. doi: 10.1080/03630269.2019.1628774 pmid: 31272240
5. Bala J, Sarin J. Empowering Parents of Children with Thalassemia. *Int J Nurs Care*. 2014;2(1):22-5. doi: 10.5958/j.2320-8651.2.1.005
6. Vidyarathi U, Kumar A. Assessment of haematological parameters in thalassemia in paediatric patients. *Intern J Med and Hea Res*. 2018;4(1):109-11.
7. Zakaria M, Hassan T. Beta Thalassemia: BoD-Books on Demand. 2020. doi: 10.5772/intechopen.78823
8. Abolghasemi H, Amid A, Zeinali S, Radfar MH, Eshghi P, Rahiminejad MS, et al. Thalassemia in Iran: epidemiology, prevention, and management. *J Pediatr Hematol Oncol*. 2007;29(4):233-8. doi: 10.1097/MPH.0b013e3180437e02 pmid: 17414565
9. Angastiniotis M. The adolescent thalassaemic. The complicant rebel. *Minerva pediatrica*. 2002;54(6):511-5.
10. Khurana A, Katyal S, Marwaha RK. Psychosocial burden in thalassemia. *Indian J Pediatr*. 2006;73(10):877-80. doi: 10.1007/BF02859278 pmid: 17090897
11. Mikelli A, Tsiantis J. Brief report: Depressive symptoms and quality of life in adolescents with b-thalassaemia. *J Adolesc*. 2004;27(2):213-6. doi: 10.1016/j.adolescence.2003.11.011 pmid: 15023520
12. Reshadat S, Zangeneh A, Saeidi S, Izadi N, Ghasemi SR, Rajabi-Gilan N. A feasibility study of implementing the policies on increasing birth rate with an emphasis on socio-economic status: a case study of Kermanshah Metropolis, western Iran. *Soc Indicat Res*. 2018;140:619-36. doi: 10.1007/s11205-017-1790-2
13. Atkin K, Ahmad WI. Living a 'normal' life: young people coping with thalassaemia major or sickle cell disorder. *Soc Sci Med*. 2001;53(5):615-26. doi: 10.1016/S0277-9536(00)00364-6 pmid: 11478541
14. Khairkar P, Malhotra S, Marwaha R. Growing up with the families of B-thalassaemia major using an accelerated longitudinal design. *Europe Psychiatr*. 2011;26(S2):381. doi: 10.1016/S0924-9338(11)72089-2
15. Lyrakos GN, Vini D, Aslani H, Drosou-Servou M. Psychometric properties of the Specific Thalassemia Quality of Life Instrument for adults. *Patient Prefer Adherence*. 2012;6:477-97. doi: 10.2147/PPA.S30763 pmid: 22848151
16. Levine L, Levine M. Health care transition in thalassemia: pediatric to adult-oriented care. *Ann N Y Acad Sci*. 2010;1202:244-7. doi: 10.1111/j.1749-6632.2010.05598.x pmid: 20712800
17. Badawy SM, Morrone K, Thompson A, Palermo TM. Computer and mobile technology interventions to promote medication adherence and disease management in people with thalassemia. *Cochrane Database Syst Rev*. 2019;6(6):CD012900. doi: 10.1002/14651858.CD012900.pub2 pmid: 31250923
18. Borimnejad L, Parvizi S, Haghaani H, Sheibani B. The effect of family-centered empowerment program on self-efficacy of adolescents with thalassemia major: A randomized controlled clinical trial. *Int J Communit Nurs Midwife*. 2018;6(1):29.
19. Baghersalimi A, Darbandi B, Kazemnezhad Leyli E, Kamran Mavardiani Z, Ahmad Sharbafi M, Rezasefat Balesbaneh A. Evaluation of Self-efficacy in Children and Adolescents With Thalassemia Major. *J Pediatr Hematol Oncol*. 2021;43(6):e754-e8. doi: 10.1097/MPH.0000000000002219 pmid: 34133385
20. Platania S, Gruttadauria S, Citelli G, Giambone L, Di Nuovo S. Associations of Thalassemia Major and satisfaction with quality of life: The mediating effect of social support. *Health Psychol Open*. 2017;4(2):2055102917742054. doi: 10.1177/2055102917742054 pmid: 29379628
21. Razzazan N, Ravanipour M, Gharibi T, Motamed N, Zarei A. Effect of self-management empowering model on the quality of life in adolescents and youths with major thalassemia. *J Nurs Educat*. 2014;3(2):48-59. doi: 10.17795/jjcdc-23366
22. Bravo L, Killela MK, Reyes BL, Santos KMB, Torres V, Huang CC, et al. Self-Management, Self-Efficacy, and Health-Related Quality of Life in Children With Chronic Illness and Medical Complexity. *J Pediatr Health Care*. 2020;34(4):304-14. doi: 10.1016/j.pedhc.2019.11.009 pmid: 32107073
23. Bandura A. Reflections on self-efficacy. *Advance Behav Res Therap*. 1978;1(4):237-69. doi: 10.1016/0146-6402(78)90012-7
24. Xiao X, Chen C, Gao C, Wang H, Reynolds NR. Ways of coping mediate the relationship between self-efficacy for managing HIV and acceptance of illness among people living with HIV. *J Adv Nurs*. 2020;76(11):2945-54. doi: 10.1111/jan.14488 pmid: 32893375
25. Sridan W, Jintrawet U, Niyomkar S. Learning self-efficacy, social support, and self-management in Syrian adolescents. *Nurs J*. 2011;48(4):132-45.
26. Haghani H, Borimnejad L. The self-efficacy of adolescents with major thalassemia and its influencing factors in Bandar Abbas. *J Pediatr Nurs*. 2015;1(3):26-33.
27. Zamanzadeh V, Valizadeh L, Ghahramanian A, Narenjbaghi SH. Personal social factors influential on the self-efficacy of the patients with thalassemia: A qualitative study. *J Nurs Midwife Sci*. 2021;8(2):120. doi: 10.4103/JNMS.JNMS_124_20
28. Gray JR, Grove SK, Sutherland S. Burns and grove's the practice of nursing research-E-book: Appraisal, synthesis, and generation of evidence: Elsevier Health Sciences 2016.
29. Woo K. Polit & Beck Canadian essentials of nursing research: Lippincott Williams & Wilkins 2017.
30. Muris P. A brief questionnaire for measuring self-efficacy in youths. *J Psychopathol Behav Assess*. 2001;23(3):145-9. doi: 10.1023/A:1010961119608
31. Tahmassian K. Validation and standardization of Persian version of self-efficacy questionnaire children. *J Appl Psychol*. 2007;1(4):5.
32. Keller G. Statistics for management and economics, abbreviated: Cengage Learning 2015.
33. Levin RI. Statistics for management: Pearson Education India 2011.
34. Behnam Vashani H, Hekmati Pour N, Vaghee S, Asghari Nekah S. Effect of Storytelling on Self-Efficacy in Children with Thalassemia: Application of Bandura's Social Cognitive Theory. *J Health Care*. 2015;17(3):230-9.
35. Tarakmeht T, Alae Karahroudy F, Mamiyanloo yangejeh H, Ghasemi E. Evaluation of the Effect of Self-care Education on the Self-efficacy of Adolescents with Thalassemia Major. *Sci J Nurs Midwife Paramedical Facult*. 2018;4(2):59-70.
36. Hekmatipour N, Vaghee S, Asghari Nekah SM. Effects of storytelling on educational self-efficacy in children with thalassemia, aged 7-12 Years old. *Evidence Based Care*. 2015;5(3):19-28.
37. Borimnejad LP, Parvizi SP, Haghaani HP, Sheibani BM. The Effect of Family-Centered Empowerment Program on Self-Efficacy of Adolescents with Thalassemia Major: A Randomized Controlled Clinical Trial. *Int J Communit Nurs Midwife*. 2018;6(1):29-38.
38. Farley H. Promoting self-efficacy in patients with chronic disease beyond traditional education: A literature review. *Nurs Open*. 2020;7(1):30-41. doi: 10.1002/nop2.382 pmid: 31871689
39. Selzler AM, Habash R, Robson L, Lenton E, Goldstein R, Brooks D. Self-efficacy and health-related quality of life in chronic obstructive pulmonary disease: A meta-analysis.

- Patient Educ Couns. 2020;103(4):682-92. doi: [10.1016/j.pec.2019.12.003](https://doi.org/10.1016/j.pec.2019.12.003) pmid: 31859120
40. Bourne MJ, Smeltzer SC, Kelly MM. Clinical teacher self-efficacy: A concept analysis. Nurse Educ Pract. 2021;52:103029. doi: [10.1016/j.nepr.2021.103029](https://doi.org/10.1016/j.nepr.2021.103029) pmid: 33780834
41. Mickley KL, Burkhart PV, Sigler AN. Promoting normal development and self-efficacy in school-age children managing chronic conditions. Nurs Clin North Am. 2013;48(2):319-28. doi: [10.1016/j.cnur.2013.01.009](https://doi.org/10.1016/j.cnur.2013.01.009) pmid: 23659816
42. Mohammadi Z. The level of loneliness, hopelessness and self-esteem in major thalassemia adolescents. Sci J Iran Blood Transfus Organ. 2012;9(1):36-43.
43. Albion MJ, Fernie KM, Burton LJ. Individual differences in age and self-efficacy in the unemployed. Australia J Psychol. 2005;57(1):11-9. doi: [10.1080/00049530412331283417](https://doi.org/10.1080/00049530412331283417)
44. Chyung SYY. Age and gender differences in online behavior, self-efficacy, and academic performance. Quarter Rev Distance Educat. 2007;8(3):213.